Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

during the time of the immersion, which should not be prolonged more than ten minutes, and which rarely need exceed five minutes. The object being either wholly or partially to remove the Turkey red dye from certain parts or places. As soon as that is done the cloth should be withdrawn from the solution of the oxymuriate of lime, and plunged or rinsed in clean water. I practise and approve the aforesaid plan of immersion, but any other plan or plans by which the cloth can be exposed a greater or less time to the action of the oxymuriate of lime, without bringing one part of the said cloth into contact with another, will answer very well.

Lastly, After having as before directed, rinsed or washed the cloths in clean water, I free them from all remains of the different agents or substances employed, by the ordinary means of washing, branning, or soaping, as practised by calico printers; and if those parts of the cloth that are intended to be made white, should still retain any red or other tinge or stain injurious to the effect, in order to render the white complete, I clear it by the usual process of exposure to the air, or by passing the cloth through hot water, to which I have added as much of the solution of oxymuriate of lime as will remove the said stains or tinge, without material injury to those parts from which the red dye is not intended to be removed.

I then proceed, if other colours are to be applied to finish the cloths, by the ordinary and well-known methods of calico printers; but these not being necessarily connected with nor forming any part of the peculiar process or invention herein intended to be described, I purposely make no mention of here.

The above particulars and examples are given for the more full explanation of the said invention, and the manner in which the same is to be performed. But the invention whereof I claim the sole and exclusive use consists in printing, stamping, penciling, or otherwise applying to those parts of the cloth which are intended to be either wholly, or in a greater or less degree deprived of their red colour, an acid, oxyd, neutral salt, acid salt, or metallic salt, such as is hereinbefore for that purpose directed, and immersing the whole cloth in such mixture or combination of oxymuriate acid and water, with some of the alkaline salts or earths, as is herein directed for that purpose.

On the laying out of Roads; by R. L. Edgeworth, Esq.

(From an Essay on the construction of Roads and Carriages.)

The roads of Britain were probably made at very remote periods, from the immediate necessity of communication between the places to which they lead. Before carriages of burden were in use, little more was required than a path upon hard ground, that would bear horses. All marshy grounds were therefore shunned; the fords of rivers were resorted to, and the inequality or circuit of the road was of much less consequence, than when carriages, instead of pack-horses, began to be employed.

When carriages were first employed, they probably were light and narrow, and did not require to have roads of any considerable breadth or firmness. And when roads had once been thus traced, indolence and habit prevented any great exertions to lay them out in better lines, or to repair them in any manner beyond what present convenience absolutely required. When heavier carriages and greater traffic made wider and stronger roads necessary, the ancient track was pursued; ignorance and want of concert in the proprietors of the ground, and, above all, the want of some general effective superintending power, continued this wretched practice, till turnpikes were established. This salutary measure created a new and far better system of roads, and the obvious utility and apparent justice of this tax might have ensured the acquiescence of the public; but so blind are the people in general to their real interests, that to whatever is new and whatever immediately requires their money, they are commonly averse. In many places, the first turnpikes were torn down, and military force was necessarily called on to compel the country people to have practicable roads for their own convenience and emolument. The introduction of turnpikes turned the attention of gentlemen to the improvement of cross-roads; but for many years, in most places, and in some to this very day, the cross-roads of England continue in a wretched state of repair.

The system of following the ancient line of road has been so pertinaciously adhered to, that roads have been sunk many feet, and in some parts many yards below the surface of the adjacent ground; so that the stag, the hounds, and horsemen, have been known to leap over a loaded waggon, in a hollow way, without any obstruction from the vehicle.

It is worth observing, that when land was comparatively of small value, it was more difficult to obtain ground for a new road, than it is at present, when a square yard of land costs more than would have purchased a perch of land in former days The fact is, general knowledge has been so diffused in England, that the prejudices of farmers and landholders have yielded to calculation; they perceive that good roads are profitable as well as agreeable; and that whatever facilitates communication increases the demand, and secures a ready price for all commodities. Why many roads still continue without alteration or repair, is a question that cannot easily be answered. In hilly countries one reason may be assigned for this neglect: a certain number of horses are absolutely necessary to raise a given load up the hills, and the same number of horses are sufficient to drag it through the worst roads in the intervening level ground. Any spot of marshy or rugged road, that requires a strong team to drag the carriage over it, will have the same effect as a steep hill, in making it indifferent to the waggoner what the rest of the road might be, as he must have a certain number of horses to get over some particular obstruction in his way. It is not pretended, that these are the only causes which prevent the amendment of our worst roads; the system of parish repairs of highways is in itself sufficient to prevent improvement.

In all countries similar systems have been found unpopular. One of the heaviest complaints of farmers in France, at the revolution, arose from the oppression of the *corvées*; and yet nothing appears more equitable, than that a district should keep its own roads in repair.

In fact, nothing but a general system for all the roads of a kingdom can be effectual; it is in vain, that one parish repairs its roads, if its neighbours will not do the same; for the neglect of any one part renders the whole impassable, without a team of sufficient strength to get over what has been neglected.

The cross-roads in France and in Ireland are better than those in England; because in France they are under the immediate superintendence of the government, and in Ireland under the care of the grand juries at assizes. It has been said, that the establishment of turnpikes caused the first general attempts to the improvement of roads, though this may be the fact, yet it is equally true, that many of the turnpike trusts in England have failed; and that many of them are not only deeply in debt, but insolvent. These failures have arisen from various causes: but one obvious defect is common to most of these *trusts*; they have borrowed money from individuals to make the roads in the first instance; and the interest of the capitals has been paid out of the tolls; leaving scarcely any thing for keeping the roads in repair. Now to secure a fund for repairs, the money expended on the road should in no ways interfere with the produce of the tolls, which should be exclusively appropriated to improvements and repairs.

To remedy these evils, commissioners should be appointed resident in London, with extensive powers, to whom all the accounts of the expenditure on roads should be annually sent. Here they should be audited in the last resort; all proposals and plans for new lines of roads, and for improvements of old ones, should be laid before this board; who should in every case of importance send an engineer of eminence, to report on the subject. Engineers thus employed should not have any permanent salary, but should be paid for each survey; they should not be permitted to appoint a deputy, nor should they be paid till their report has been examined by the commissioners.

Particular sessions should be held in each county, for the local management of whatever concerns the roads of the county. At these sessions the accounts of all persons employed in the management of roads should be examined, before they are sent to the commissioners; and all plans, proposals, and estimates for new roads, and alterations and repairs of old ones, should here be considered, before they are sent to London. At these sessions acting surveyors should be appointed. They should not be named from compassion or favour; they must be men of activity, much prudence, and of some knowledge; and they should be changed from one place to another, after certain periods, so as to guard them against local temptations. Before such a system can be carried into effect, full and accurate maps of every part of the country are necessary. As all the counties of England have been surveyed, particular road maps may be easily made, without surveying much of the adjacent country. The bearings and distances of towns and bridges may be taken from the present maps; but every perch of the road itself should be minutely laid down, and its levels ascertained; and this may be done at a very small expense.

These maps must contain every thing relative to the roads, so that when any new line is proposed, or the alteration of any old one, it may be marked with a pencil on the road map; thus all their bearings may be seen at once, and considered at leisure. A road map should be accompanied by sections, representing the heights of hills by perpendicular lines.

These lines should be drawn on one side of the road, so as to denote the precise elevation of every part of the hill over which the road passes, not by distorted representations of the different levels, as has been frequently attempted. The figure of an exact section of road by any visible scale would convey no idea that could be useful: whereas vertical lines, with numerical figures annexed to them, would be perfectly intelligible. A book should accompany each map, explaining the advantages and defects of the old roads, and pointing out such improvements as ought to be attended to in future. In this book the proximity of villages, mills, manufactures, and gentlemen's seats should be noted, so that the general advantage might be attended to, in laying out a new road, as far as would be compatible with the principal object of the new line. The book should also refer to the places where proper materials are to be found, with their cost at the pit, so that knowing the distance to which it is necessary to carry them, the expense of making and mending may be ascertained. This book should also contain plans and estimates of necessary sewers, drains, and bridges, the boundaries of parishes, the houses on each side of the road, and in short whatever is necessary to form a working plan for an overseer. Engraving such maps as these for each county, and for smaller districts, as elegance is not requisite, would cost but a mere trifle; and by these means, at a small expense, every parish and every surveyor might be furnished with a map of what concerned their own district.

Beside the present convenience of such maps, and of books and tables connected with them, their utility would be durable; and if memorandums were kept of what was done from time to time, and under whose inspection, a laudable emulation might be excited, and one general view of neglects and improvements would be within reach of the public.

When a superintending power has been once established, and adequate maps, plans, and sections have been procured, an impartial engineer should be employed to examine the country where any road is intended to be laid out, as has been before recommended, so that he may be able to accommodate the new line to local circumstances, without permitting partial and private interests to supersede public advantage. Temporary conveniences should, of course, give way to what is permanent, for many roads have been made to deviate from their proper course, from the narrow-sighted policy of individuals.

Roads should be laid out, as nearly as may be, in a straight line; but to follow, with this view, the mathematical axiom, that a straight line is the shortest that can be drawn between two points, will not succeed in making the most commodious roads; hills must be avoided, towns must be resorted to, and the sudden bends of rivers must be avoided. All these circumstances must be attended to; therefore, a perfectly straight road cannot often be found of any great length. It may perhaps appear surprising, that there is but little difference in length between a road that has a gentle bend, and one that is in a perfectly straight line. A road ten miles long, and perfectly straight, can scarcely be found any where; but if such a road could be found, and if it were curved, so as to prevent the eye from seeing farther than a quarter of a mile of it, in any one place, the whole road would not be lengthened more than one hundred and fifty yards. It is not proposed to make serpentine roads merely for the entertainment of travellers; but it is intended to point out, that a strict adherence to a straight line is of much less consequence, than is usually supposed; and that it will be frequently advantageous to deviate from the direct line, to avoid inequalities of ground.

It is here, that the skill of the engineer is to be exerted, a skill that is seldom apparent in the laying out of English roads.

Some years since, a blind man was advantageously employed in Yorkshire, and in Derbyshire, in laying out roads in those hilly counties. The blind man followed the streams, which made their way among the hills, and by finding out the *chords* of such bends of the stream as passed over practicable ground, he succeeded in his attempts. It is obvious, that, where the *arc* described by a road going over a hill, is greater than that which is described by a circuit, the circuit is preferable; but it is not known to every overseer, that within certain limits it will be less laborious to go round the hill, though the circuit should be much greater than that which would be made in crossing the hill. Where a hill has an ascent of no more than one foot in thirty, the thirtieth part of the whole weight of the carriage, of the load, and of the horses, must be lifted up, whilst they advance thirty-feet. In doing this, one-thirtieth part of the whole load continually resists the horses' draught; and in drawing a waggon of six tons weight, a resistance equal to the usual force of two horses must be exerted.

The most sudden ascents, in the roads in England, are usually over canal-bridges. It has been proposed to make winding roads to these bridges; but for this there is no necessity, as the expense of continuing the present inclined roads, that go over them, to a proper distance, cannot be very considerable.

What is here said, respecting level roads, must not be strained to an assertion, that a perfectly level road is always the best for every species of draught. Slight and short alternations of rising and falling ground are serviceable to horses moving swiftly; the horses have time to rest their lungs, and different muscles: and of this experienced drivers know well how to take advantage.

On Planting Forest Trees; by H. Ainslie, M.D. of Dover-street.

(From the Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce.)

Having determined to plant a large intack of 77 acres 30 perches, part of a barren common long since inclosed and fenced round with a stone-wall six feet high, I selected 16 acres of it which were much exposed, and planted them, in the year 1807, with 22,700 larches, 3,700 oaks, and 2000 Scotch firs. I expected these plants would break the force of the winds, and protect those I might plant at a future period.

The remaining part of this intack I planted in the spring of 1809, with 96,150 larches, 10,300 Scotch firs, 3,400 oaks, 1990 beech, and 1000 Spanish chesnuts. In the winter of the same year, I filled all the vacant spots with 10,000 larches: the plantation therefore contains 151,240 forest trees, of which 28,400 were planted in 1807, 112,840 in the spring of 1809, and 10,000 in the following winter. The certificates I annex, refer to the 112,840 planted in the spring of 1809, but the whole are included in the expression of their flourishing state.

The Society will consider me as merely presenting them with an account of my having planted 112,840 forest trees upon 61 acres in the spring of the year 1809; and I shall be happy if the following observations respecting the whole of my plantations for 22 years, should be thought deserving of their notice. The total of forest trees I have planted, is 378,563.

Since I had last the honour of presenting myself to the Society of Arts, &c., as a candidate for one of their honorary rewards to planters of forest trees, I have not been idle in a pursuit which has given me so much pleasure. Unfortunately, however, I am tied down by my profession so closely to the metropolis, that I have only been able to visit my plantations once in two years, and never in one season to dedicate more than a week or ten days to their management. This time, short as it is, has not been thrown away, and as what I have done has answered my expectations, it may meet the wishes of the Society to be made acquainted with it; and I am the more induced to submit some observations to them, because I find in their annual publications, many accounts of putting trees into the ground, but few of their treatment afterwards. Upon subsequent treatment, however, every thing depends, for I agree with an old gentleman who many years ago told me, that any fool could plant, but only a wise man could rear timber. The difficulties I felt in my first attempts, would have been much lessened, had I sooner had the advantage of seeing the excellent papers presented to the Society by Mr. Waistell, published in their 25th volume; they have been invaluable to me, and cannot fail to prove so to all planters.

I cannot express the mortification I felt in passing some large plantations of firs, in my way to and from the North of England last year. For thirty years, I can venture to say, no axe has been near them, and the trees now stand disgraceful poles